User Manual

ETU01-D

Single Port E1 Access Unit
with Fixed V.35 Datacom I/F

CTC union **CTC Union Technologies Co., Ltd.**

CTC Union Technologies Co., Ltd.
Far Eastern Vienna Technology Center (Neihu Technology Park)
8F, No. 60 Zhouzi St.
Neihu, Taipei 114
Taiwan
Tel: +886-2-26591021
Fax: +886-2-27991355
Email: info@ctcu.com
URL: http://www.ctcu.com

ETU01-D User manual
English version 1.2 January 2007

User Manual for Single Port E1 Access Unit
Thank you for choosing our product.
Please read this manual carefully before using the ***ETU01-D*.**

This manual supports the following models:
ETU01-D 100-240 VAC model
ETU01-D –48V DC model

Copyright © 2006, CTC Union Technologies, Inc.
All rights reserved.

All specifications are subject to change without prior notice.

Table of Contents

Chapter 1. Introduction
1.1 Introduction 7
1.2 Functional Description 7
1.3 Typical System Applications 8
1.4 E1 signal structure 9
1.5 ETU01-D Capabilities 10
1.6 TECHNICAL SPECIFICATIONS 12
Chapter 2. Installation
2.1 General 15
2.2 Site Preparation 15
2.3 Mechanical Assembly 15
2.4 Electrical Installation 17
Chapter 3. Front Panel Operation
3.1 GENERAL 19
3.2 CONTROLS AND INDICATORS 19
3.3 Menu Operation 20
Chapter 4. Control Port Operation
4.1 General 31
4.2 Terminal Connection 31
4.3 Menu System Detail 32
Chapter 5. Loop Back and BERT Tests
5.1 Test Loops 57
Appendix
Appendix A 61
Technical Inquiry Form

Table of Contents

Chapter 1 Introduction

1.1 Introduction

The ***ETU01-D*** provides an economic access solution for Fractional E1 network services. Single DTE device may be linked to the ***ETU01-D*** at combined data rates of 64kbps to 2048kbps.

The ***ETU01-D*** supports local control and diagnostics via the front panel LCD and a serial RS-232 craft port. This feature enables users to easily configure the unit, execute the in-service diagnostics and monitor the network status.

1.2 Functional Description

The ***ETU01-D*** data channel support user-selectable transmission rates, which are integer multiples of 64kbps, up to a maximum 2.048Mbps on twisted pair or coax cable. The ***ETU01-D*** fully meets all of the E1 specifications including ITU G.703, G.704, G.706, G.732, and G.823.

Multiple clock source selection provides maximum flexibility in connecting both the E1 and user interfaces. The ***ETU01-D*** has the flexibility to meet the timing requirements of various system configurations. The timing modes for the E1 link and for the user channel are selected by the setting of configuration data via the front panel LCD display, or terminal mode console port. The E1 link may be clocked from the E1 recovered receive clock, from the user data port, or from the internal oscillator.

The ***ETU01-D*** provide IDLE CODE mode, you can set any time slot and insert the idle code with '00'-'FF', and the default code is '7F'.

The ***ETU01-D*** includes a BERT generator and receiver which may internally connect to either E1 or data channel.

The ***ETU01-D*** is available in either AC or DC models. The models include AC (100-240VAC) or DC (18-72VDC).

1.3 Typical System Applications

General

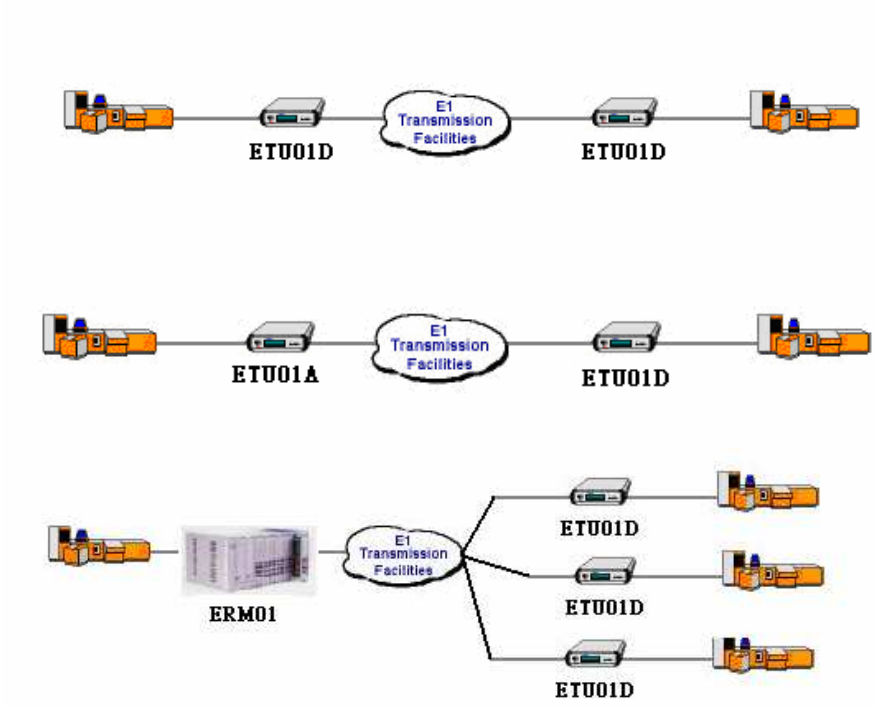


Figure 1-1: Example; Typical Application

In a typical application (Figure 1-1), the ***ETU01-D*** is used to connect the synchronous data channel of a single router and the local and remote LANs over an E1 line. The fractional E1 data service is based on the assumption that the combined user data rate of all channel modules is equal to or is a fraction of the full available E1 bandwidth, in multiples of 64K.

1.4 E1 signal structure

The E1 line operates at a nominal rate of 2.048Mbps. The data transferred over the E1 line is organized into frames, with each E1 frame containing 256 bits. The 256 bits are organized as 32 time slots of eight bits each and carry the data payload.

E1 transmissions utilize two main types of framing: Frame Alignment Signal (FAS) and Multi-Frame Alignment Signal (MFAS). Framing is necessary in order for equipment receiving the E1 signal to be able to identify and extract the individual channels. PCM-30 (CAS) transmission systems use MFAS framing along with FAS framing. PCM-31 (CCS) transmission systems use only FAS framing.

Frame Alignment Signal (FAS) The 2.048 Mbps frame consists of 32 individual time slots (numbered 0-31). As described previously, each time slot consists of an individual 64 Kbps channel of data. In the FAS format, time slot 0 of every other frame is reserved for the frame alignment signal pattern. Alternate frames contain the FAS Distant Alarm indication bit and others bits reserved for national and international use.

Multi-Frame Alignment Signal (MFAS) MFAS framing uses Channel Associated Signaling (CAS) to transmit the A/B/C/D bits signaling information for each of 30 channels. This method uses the 32 time slot frame for mat with time slot 0 dedicated for the Frame Alignment Signal (FAS) and time slot 16 dedicated. For the Multi-Frame Alignment Signal (MFAS) and the Channel Associated Signaling (CAS).

E1 line signal

The basic E1 line signal is coded using the Alternate Mark Inversion (AMI) or HDB3 rule.

In the AMI format, "ones" are alternately transmitted as positive and negative pulse, whereas "zeros" are transmitted as a zero voltage level. AMI is not used in most 2.048 Mbps transmissions because synchronization loss occurs during long strings of data zeros.

In the HDB3 format, a string of four consecutive zeros is replaced with a substitute string of pulses containing an intentional bipolar violation. The HDB3 code substitutions provide high pulse density so that the receiving equipment is able to maintain synchronization with the received signal.

1.5 ETU01-D Capabilities

E1 link line coding

The ***ETU01-D*** supports two E1 line codes:

AMI coding.
HDB3 coding.

E1 framing formats

The ***ETU01-D*** supports three formats:

Unframed format. (in Unframed, only Data port 1 is supported)
FAS (CCS, PCM-31) format. (TS0 reserved)
MFAS (CAS, PCM-30) format. (TS0 and TS16 reserved)

User data channel rates

The ***ETU01-D*** supports each user data channel rates which are a multiple of 64kbps. For maximum flexibility, the ***ETU01-D*** supports combined data rates up to 2.048Mbps.The ***ETU01-D*** supports flexible time slot assignment, allowing the user to freely specify the selection of time slots, in sequence or randomly, for each data channel.

User data channel interface

The ***ETU01-D*** has a single user data channel interface and it is a fixed type of user data channel interface: V.35.

System Timing Considerations

The ***ETU01-D*** has the flexibility to meet the timing requirements of various system configurations. The timing mode for the E1 link and for the user channel are selected by the setting of configuration data via the front panel LCD display.

E1 link timing

The ***ETU01-D*** E1 link receive path always operates on the receive clock. The ***ETU01-D*** recovers the receive clock from the received E1 link data signal. The source of the ***ETU01-D*** E1 link transmit clock can be selected by the user.

The following E1 link transmit timing modes are available.

- **Loop back timing**

  The ***ETU01-D*** E1 link transmit clock is locked to the recovered receive clock (E1 link). This is usually the timing mode selected for network operation.

- **Internal timing**

  The ***ETU01-D*** E1 link transmit clock is derived from the internal clock oscillator. This timing mode is necessary in point-to-point applications over leased line. In this case, one ***ETU01-D*** must use the internal oscillator, and the others must operate from the recovered clock.

- **External timing**

  The ***ETU01-D*** E1 link transmit clock is locked to the clock signal provided by the user DCE connected to the user's data channel. When the data channel is used as the clock source, the data channel must use clock timing mode 2 (DTE).

User data channel timing
The ***ETU01-D*** has two user data channel clocking modes:

- **Clock mode 1 (DCE)**

  The ***ETU01-D*** data channel operates as a DCE providing the transmit and receive clocks (recovered timing) to the data terminal equipment connected to the user channel. The clocks are locked to the master timing.

- **Clock mode 2 (DTE)**

  The ***ETU01-D*** data channel operates as a DTE (crossover cable required) and accepts both transmit clock and receive clock (both from the ETC pin) from the user DCE equipment.

1.6 TECHNICAL SPECIFICATIONS

Main E1

Framing	-Unframed/Framed -FAS (PCM31) / -FAS+CAS (PCM30) -CRC4 ON/OFF
Bit Rate	2.048 Mbps
Line Code	-AMI / -HDB3
Line Impedance	-Unbalanced 75 ohms / -Balanced 120 ohms
Relative Receive Level	0 to -43dB
"Pulse" Amplitude	-Nominal 2.37V+/-10% for 75 ohms -Nominal 3.00V+/-10% for 120 ohms
"Zero" Amplitude	0.1V
Tx Frequency Tracking Internal / Loop back / External Timing	+/-30 ppm, +/-50 ppm, +/-100 ppm
Jitter Performance	According to ITU-T G.823
Complies With	ITU-T G.703, G.704, G.706 and G.732
Interface Connectors	-RJ45 / -BNC

User Data Channel

Interface Types	-V.35
Interface Connectors	V.35 25 pin, D-type Female
Data Rate	N*64kbps Where N equal 1 to 31 in CCS And N equal 1 to 30 in CAS
Clock Modes	-Clock Mode 1 (DCE): Receive and transmit clock (recovered) to the Synchronous DTE -Clock Mode 2 (DTE): Receive and transmit clock from the synchronous DCE (all from ETC pin).
Control Signals	-CTS constantly ON or follows RTS -DSR constantly ON, except during test loops -DCD constantly ON, except during signal loss
Time slot allocation	User defined, randomly assignable

Setup/Configuration

LCD	2 rows of 16 characters
Pushbutton Switches	-ESC / -Left Arrow -Right Arrow / -Enter

Front Panel

Figure1-2 ***ETU01-D*** Front Panel

LED indicators

No#.	LED	Description	Remark
1	Power	Green light ON: Normal working status	
2	Alarm	Green light ON：Receive E1 Alarm (AIS, RAI, MRAI)	
3	SYN Loss	Red light ON : SYNC Loss	
4	SIG Loss	Red light ON : Signal Loss	
5	TD of Datacom	1) Yellow light ON : Signal from DTE is "1" 2) Yellow light OFF : Signal from DTE is "0" 3) Yellow light FLASH : Signal from DTE is "1" and "0"	
6	RD of Datacom	1) Yellow light ON : Signal from DTE is "1" 2) Yellow light OFF : Signal from DTE is "0" 3) Yellow light FLASH : Signal from DTE is "1" and "0"	
7	DCD	1) Green light OFF : DCD Off 2) Green light ON : DCD On	
8	RTS	1) Green light ON : RTS from DTE is ON 2) Green light OFF : RTS from DTE is OFF	
9	Test	1) Red light ON : Enables Loop Back function 2) Right light OFF : disables Loop Back function	
10	Error	1) Red light ON : BERT bits Error 2) Red light OFF : BERT bits no Error	

RS-232 CONSOLE port
Port interface: V.24/RS-232 asynchronous, DCE
Port connector: 9 pin D-type female
Data rate: 19200 bps
Data format: 1 start bit -8 data bits -No parity -1 stop bits
Alarm relay: Floating pair of NO and NC contacts
-Contact ratings: 1A at 30 VDC resistive or 0.5A at 125 VAC resistive

Physical
Height: 44 mm
Width: 195 mm
Depth: 245 mm
Weight: 925g net

Power supply
Voltage (AC model) 100 ~ 240 VAC
Voltage (DC model) 18 ~ 72 VDC
Frequency 47 to 63 Hz for AC power
Power consumption 15 VA

Environment
Temperature 0-50C / 32-122F
Humidity 0 to 90% non-condensing

Chapter 2 Installation

2.1 General

This chapter provides detailed instructions for mechanical installation of the ***ETU01-D***. Following the completion of installation, please refer to Chapter 3 for front panel operating information and Chapter 4 for console port operating information.

2.2 Site Preparation

Install the ***ETU01-D*** within reach of an easily accessible grounded AC outlet. The outlet should be capable of furnishing 100 to 240 VAC. Allow at least 10cm (4 inch) clearance at the rear of the ***ETU01-D*** for signal lines and interface cables.

2.3 Mechanical Assembly

The ***ETU01-D*** is designed for tabletop, shelf or rack mount installation, and except for rack mount installation, is delivered completely assembled. Rack mounted applications require installation of additional rack mounting brackets. No provisions are made for bolting the ***ETU01-D*** to the tabletop.

All Standalone/Rack Series units have the option of adding standard EIA 19" or 23" rack mount capability. Two rack mount options provide for either mounting a single unit (half space) in a rack or for mounting two units in tandem (full space). In either situation, one standard rack unit space is required. Each rack mount kit provides all the necessary hardware for a complete installation.

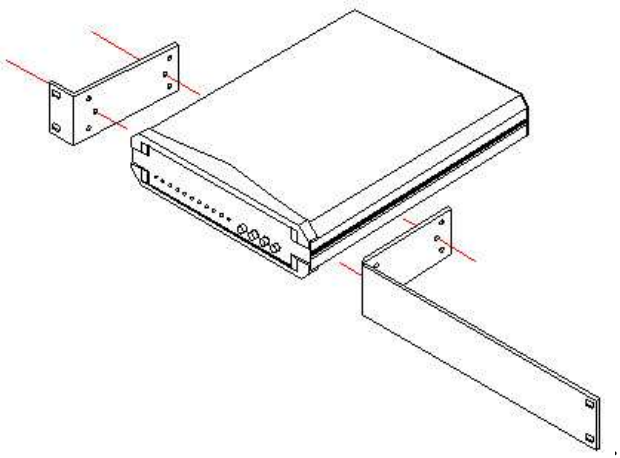


Figure 2-1: Single Unit Mounting

In single unit installations, the unit may be placed in the left or right side position simply by reversing the rack mounting "ears". The kit includes, one (1) short and one (1) long rack adapter, four (4) 3x8mm self-tapping screws, and four (4) #12-24x0.5" screws.

In order to save rack mount space, units may be mounted in tandem. Please refer to the following drawing examples for this application.

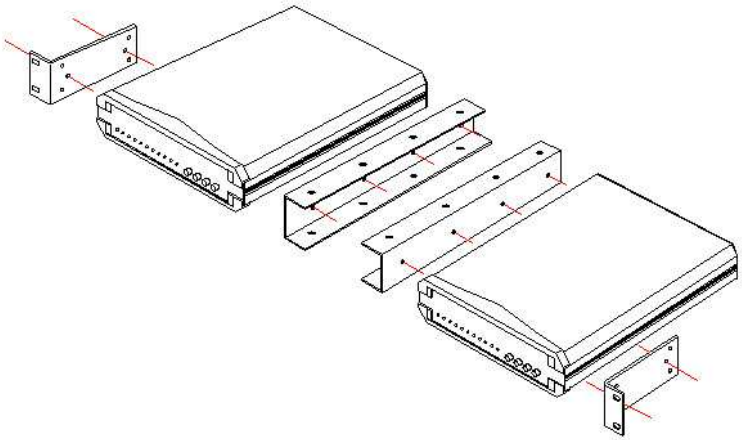


Figure 2-2: Tandem Units Mounting (Exploded)

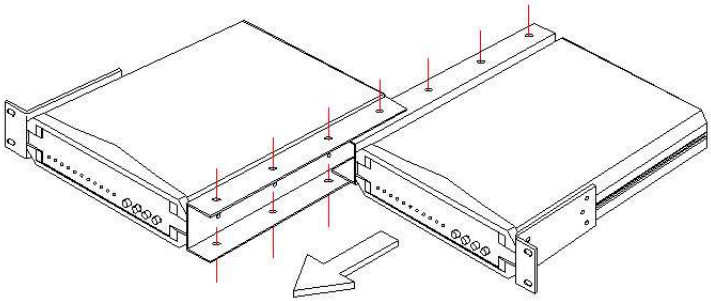


Figure 2-3: Tandem Units Mounting Detail

The tandem kit includes two (2) rack mount adapters, one (1) each of inner and outer central mounting adapters, twenty (20) 3x8mm self-tapping screws, and four (4) #12-24x0.5" screws.

2.4 Electrical Installation

2-4-1. Power connection

AC power is supplied to the ***ETU01-D*** through a "Mickey Mouse" type plug. The ***ETU01-D*** should always be grounded through the protective earth lead of the power cable.

2-4-2. Rear panel connectors

The data channel interfaces is fixed on the rear panel of the ***ETU01-D*** (Refer to Figure 2-4 & 2-5) and consist of MB34pin connector for V.35. One RJ-45 (balanced type) interface and one pair of BNC (unbalanced type) Coax connectors are available for the E1. The last connector is a DB9pin connector for the terminal mode console port.

Figure 2-4 ***ETU01-D*** rear panel (AC model)

Figure 2-5 ***ETU01-D*** rear panel (DC model)

E1 Line side

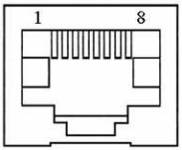
BNC coax connector

One BNC coax pair of connectors marked RX and TX, provide unbalanced 75 Ohm connections for the E1 lines.

RJ-45 INTERFACE

A single RJ-45 connector marked E1, provide balanced 120 Ohm.

The pin assignments for RJ-45 connectors are as follows:



1 RTIP (Receive data in)
2 RRING (Receive data in)
4 TTIP (Transmit data out)
5 TRING (Transmit data out)

Note: This follows the **USOC RJ-48C** standard.

Chapter 3 Front Panel Operation

3.1 GENERAL

This chapter describes the ***ETU01-D*** controls and indicators, and explains operation setup procedures using the front panel LCD and menu keys. Installation procedures (in Chapter 2) must be completed and checked before attempting to operate the ***ETU01-D***.

Note: To ensure stability, we recommend that after setting all the parameters and doing a "save & reboot".

3.2 CONTROLS AND INDICATORS

All controls (push-button switches), LCD display and LED indicators are located on the ***ETU01-D*** front panel. The momentary on pushbutton switches are used to activate menu selections and select parameter settings.

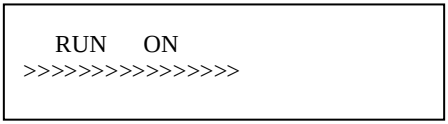
Figure 3-1: ***ETU01-D*** Front Panel

Use the 'LEFT' and 'RIGHT' function keys to browse the menus and select parameters.
Use the 'ESC' function key to return to a previous menu or to abandon setup.
Use the 'Enter' function key to set a parameter of a selection or to enter a sub-menu.

3.3 Menu Operation

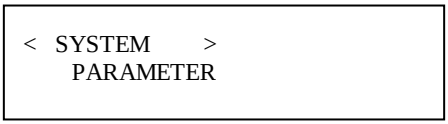
3.3.1 Top Level Menus

The following are the 8 top level Menus. Press an arrow key (LEFT or RIGHT) to select another top level Menu or press ENTER to reach a sub menu.

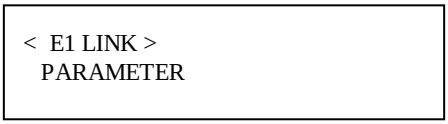


For normal transmissions, the unit must be in 'RUN' mode.

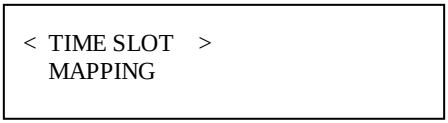
When powered on, the ***ETU01-D*** will work under the last saved setting. Press ESC to stop the running, and the LCD will display:



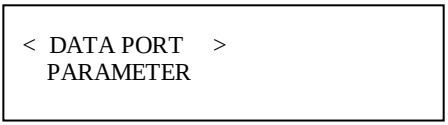
Set the default system parameter, save the present parameter, reset the system, and choose the system clock.



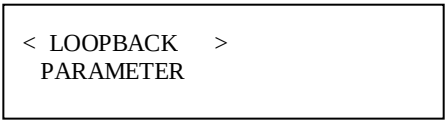
Set the Line code, interface and distance, transmit buffer, receive buffer, Frame type, and idle code for E1 link.



Assign the E1 timeslots to the Data Channels link.

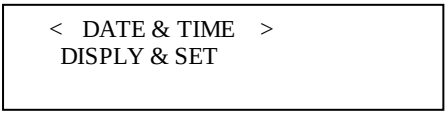


Data Port informational screen and settings for Clock Mode, Clock Polarity and Handshaking.

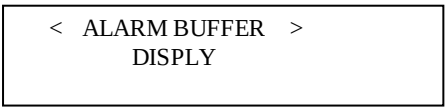


Enable main link, or data channel Loop back.

Enable BERT, select channel and select pattern.

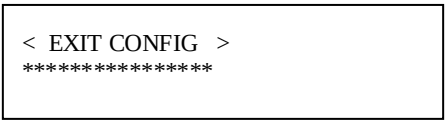


Enable display the system date and time.



Enable display the alarm records which been stored in the buffer or delete all the record

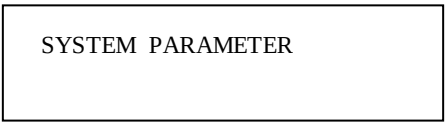
Enable display all the parameter performance..



Exit the configuration and run the ***ETU01-D***.

3.3.2 System Parameter Detail

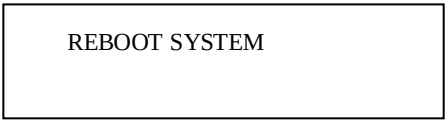
The following screens show the setup screens under the System Parameter Main Screen.



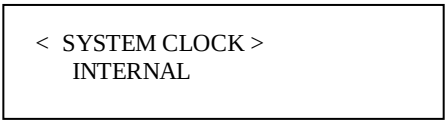
Press ENTER; the SYSTEM PARAMETER sub-menu will be displayed.You can modify all the system parameters, save all changes, or reset the unit back to the default settings.

Press ENTER, the ***ETU01-D*** will work in the default mode.

Press ENTER, the ***ETU01-D*** will store all the parameters as current settings and then reboot. The next time the ***ETU01-D*** is powered on, all the parameters used will be those that were previously saved.
NOTE: Remember to save the parameters if you want to commit the *ETU01-D* with the current parameters. If not, the ***ETU01-D*** will resume all the parameters from the last saved settings when it is powered on the next time.



When pressing ENTER here, the system will reply with Y/N:[N]. Press ENTER again and the system will show Y/N:[Y] and then reboot. Otherwise, press ESC to leave without rebooting the system.



Press ENTER to set the system clock: *Internal/External(Data Port)/Recovery(E1)*.

In a typical point-to-point application, the local unit will set the clock source to the built-in oscillator (Internal) and the remote unit will recover clock from the received E1 (Recovery).

If the clock source comes from connected DCE equipment, such as a multiplexer or another modem, a crossover cable may be employed to send the connected DCE's clock from the RC to the ETU01-D's ETC and the clock setting will be set to the data port (External).

3.3.3 Main E1 Parameter Detail

The following screens show the setup under the Main E1 Parameter.

```
< MAIN E1 LINK >
  PARAMETER
```

Press ENTER and the MAIN E1 LINK sub-menu will be displayed. Main E1 Link sets the *LINE CODE*, *IMPEDANCE*, *LBO*, *TX JITTER*, *RX JITTER*, *FRAME* type and CRC mode for the mainE1 of the ***ETU01-D***.

```
< LINE CODE   >
   [HDB3]
```

Use the arrow keys to browse the individual link parameters (frame, CRC, etc.) Press ENTER on the parameter to select it with the cursors. Now use the arrow keys to browse the available settings for that parameter. The following is a breakdown of parameters and available settings:
LINE CODE: HDB3 or AMI, HDB3 default.
IMPEDANCE: 120ohm or 75ohm, 120ohm default.
LBO: SHORT or LONG, SHORT default.
TX JITTER: ON or OFF, OFF default.
RX JITTER: ON or OFF, OFF default.
FRAME: unframed, CCS or CAS, unframed default.

Technical Note: If E1 framing is set to "CAS", CRC-4 is always "ON". The connected E1 equipment may either set its CRC4 "ON" or simply ignore CRC4. This will not effect the normal transmission.

3.3.4 Time Slot Mapping Detail

The following screens show the setup under the Time Slot Mapping.

```
< TIME SLOT    >
  MAPPING
```

Press ENTER

```
NNNNNNNNNNNNNNNN
NNNNNNNNNNNNNNNN
```

The E1 frame is shown with 32 timeslots, top row left to right are TS0-15, while the bottom row displays the settings for TS16-31. Press arrows to move the cursor, use ENTER to assign the timeslot as follows:

N: Not assigned
Y: Data Channel .
C: Insert idle code on E1 Tx side.
(Refer to E1 Link Parameter Detail to set the idle code.)
B: BERT test.

Note:

TS 00: Cannot be assigned in CCS or CAS mode of MAIN E1 LINK to anything but Framing. BERT cannot be assigned to TS 00.

TS 16: Cannot *be* assigned in CAS mode to anything except Signalling. BERT cannot be assigned to this timeslot in CAS and CCS mode.

3.3.5 Data Port Parameter Detail

The following screens show the setup under the Data Port Parameter.

```
< DATA  PORT  >
  PARAMETER
```

This screen shows the Channel interface type. Press ENTER and the Channel sub-menu will be displayed. It contains the Clock Select and Clock Polarity.

```
< CLOCK SELECT  >
     [DCE]
```

Press ENTER to Select: DCE/DTE

```
< CLOCK POLARITY
  Tx pos   Rx neg
```

Press ENTER to select the Clock Polarity:

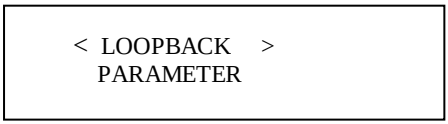
Type1:	*Tx pos*	*Rx neg*
Type2:	*Tx pos*	*Rx pos*
Type3:	*Tx neg*	*Rx pos*
Type4:	*Tx neg*	*Rx neg*

Tx: Transmit clock
Rx: Receive clock
Pos: Data sync at the clock rising edge.
Neg: Data sync at the clock falling edge.

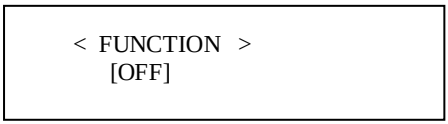
Note: If all parameters are set correctly and the data port transmission fails, please adjust clock polarity to correct the transmission.

3.3.6 Loop back Parameter Detail

The following screens show the setup under the Loop back Parameter. In order to perform Remote Loop back functions, the E1 frame format must be CCS or CAS mode. Remote loop back is not supported in unframed mode. In BERT mode, the user may also perform loop back test functions.



Press ENTER



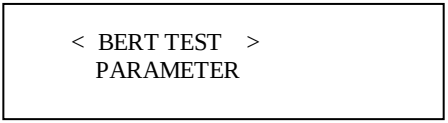
Use the arrow keys to browse the available options for loop back setting. By default, all loop backs are off. The details are as follows:

Main Link: *Loop back off, Local Analog, Local Digital, Local Payload, Remote Analog, or Remote Payload.*

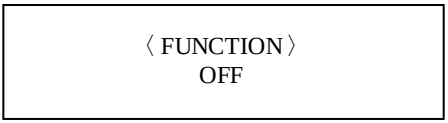
Data Port : *Loop back off, Local Analog, or Local Digital.*

3.3.7 BERT Parameter Detail

The following screens show the setup under the BERT Parameter.



Press ENTER



Use the arrow keys to browse the available options for BERT setting. By default, *BERT* is off. The details are as follows:

CHANNEL: MAIN -〉 MAIN, or

PATTERN: 2e11-1 or 2e15-1.

For BERT TEST go to 3.3.4 "Time Slot Mapping Detail" and setup E1 frame to "B" for BERT TEST

Note: BERT is not supported with Unframed E1. In BERT test, E1 should be in framed mode (either CCS or CAS), patterns will pass through the time slots you choose except TS0 and TS16.

3.3.8 Performance

Note: The BPV reception count in the ETU01-D is not sensitive. This means the number of BPV transmitted may be different from the number of BPV received. This is due to the E1 framer chip used in the ETU01-D and is beyond our control.

3.3.9 Exit Configuration

******IMPORTANT****** All of the configuration settings performed up until now can be activated by exiting the configuration menu, back out to 'RUN. However, unless the settings have been **SAVED**, they will be lost at next power cycle. So, if these are the settings you wish to use permanently, be sure to go back to the *SYSTEM PARAMETER* menu and do *SAVE SET*. Then exit the configuration to the 'RUN' mode.

3.3.9 ETU01-D LCD menu breakdown

Main Menu	Sub-Menu	Menu Options
RUN ON		
SYSTEM PARAMETER	DEFAULT	Y
		N
	SAVE & REBOOT	Y
		N
	REBOOT SYSTEM	Y
		N
	SYSTEM CLOCK	INTERNAL
		EXTERNAL
		RECOVERY
	PASSWORD	SET PASSWORD
		CLEAR PASSWORD
	CONTROLLED	OFF
		ETU01-D
		ERM-01
E1 LINK PARAMETER	LINK CODE	HDB3
		AMI
	IMPEDANCE	75ohm
		120ohm
	LBO	SHORT
		LONG
	TX JITTER	ON
		OFF
	RX JITTER	ON
		OFF
	FRAME	Unframed
		CCS
		CAS
	CRC-4	ON
		OFF
	IDLE CODE	
TIME SLOT MAPPING	N	
	Y	
	C	
	B	
DATA PORT PARAMETER	CLOCK SELECT	DCE
		DTE
	CLOCK POLARITY	TX POS
		RX POS

		TX POS RX NEG
		TX NEG RX POS
		TX NEG RX NEG
LOOPBACK PARAMETER	FUNCTION	ON
		OFF
	E1	CLOSE
		LOCAL ANALOG
		LOCAL DIGITAL
		LOCAL PAYLOAD
		REMOTE ANALOG
		REMOTE PAYLOAD
	DATA PORT	CLOSE
		LOCAL ANALOG
		LOCAL DIGITAL
BERT TEST PARAMETER	FUNCTION	ON
		OFF
	CHANNEL	E1 LINE
	PATTERN	2E11-1
		2E15-1
		QRSS
DATA&TIME DISPLAY&SET		
ALARM BUFFER DISPLAY	LOCAL ALARM BUFFER	
	CLEAR ALARM BUFFER	Y
		N
PERFORMANCE MONITOR	BPV CNT	
	CRC-4	
	ERR SECS	
	UAS	
	LONG ES	
	LONG UAS	
	CURR SEC	
EXIT CONFIG		

Chapter 4 Control Port Operation

4.1 General

The ***ETU01-D*** Control Port (labeled RS-232) is a console terminal port designed to facilitate setup of all parameters through the use of a standard text based terminal or any terminal emulation program running on a Personal Computer.

Note: To ensure stability, we recommend that after setting all the parameters and doing a "save & reboot".

4.2 Terminal Connection

A notebook computer has become an invaluable tool of the Systems Engineer. Connection to the computer is very straight forward. The only other hardware required is a DB9-pin one-to-one, male to female cable. The ***ETU01-D*** acts as a DCE to the PC's DTE communications port. A convenient application, provided with the Microsoft Windows® 98/NT/2K/XP operating systems, is "Hyper Terminal". Set the properties to match the ***ETU01-D*** control port defaults as follows: Bits per Second=19200, Data bits=8, Parity=None, Stop bits=1, and Flow Control=none. Make the appropriate connections, start the terminal application, apply power to the ***ETU01-D,*** *then press ENTER on the PC keyboard*.

Note: When a terminal connection is made to the ***ETU01-D***, the front panel LCD will be locked out and display:

```
* CONTROL PORT *
CONNECTED >>>>>
```

4.3 Menu System Detail

The menu systems are displayed in the same order and with the same parameters as those in the LCD display. The following section will detail actual displays with descriptions of parameter settings via relevant key commands.

This is the first screen seen after connecting. Note that the first two items, Display and Define deal with all the system settings. The Display item will browse settings for viewing only, while under Define, all parameters may be both viewed and changed.

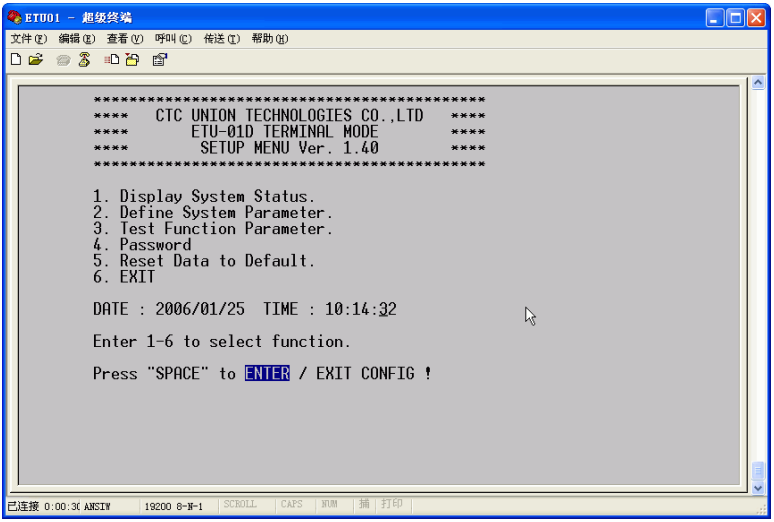
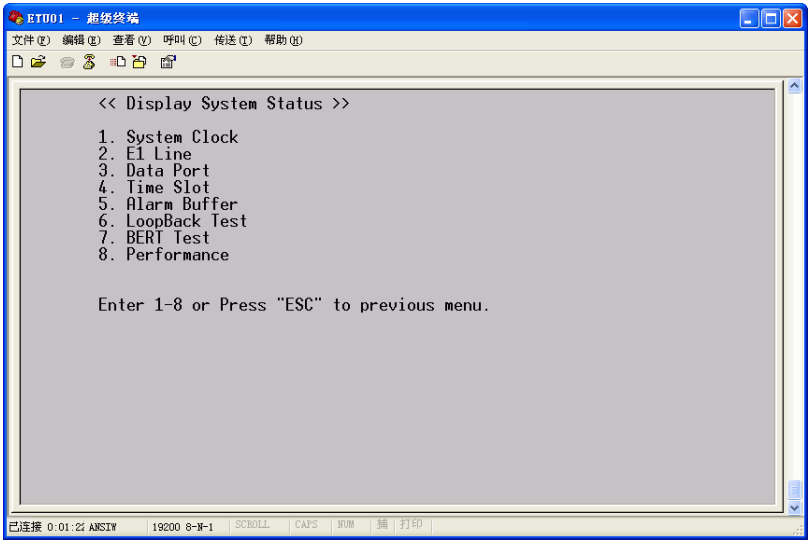


Figure 4-2 Top menu

Enter 1 to *Display System Status*



Enter 1 to *Display System Clock Parameter*

```
<< Display System Clock Parameter >>

System Clock : INTERNAL

Press "ESC" to previous menu.
```

The display shows that the System Clock Parameter is derived from the internal oscillator. Exit this menu to the previous one, Press ESC.

Enter 2 to *Display E1 Parameter*

```
        << Display E1 Parameter >>

        Line Code : HDB3
        Impedance : 75 ohm
        LBO       : SHORT
        TX Jitter : OFF
        RX Jitter : OFF
        Frame     : CCS
        CRC-4     : OFF
        Idle Code : 7FH


        Press "ESC" to previous menu.
```

The above display shows the settings for the E1 Line Code, E1 interface impedance, LBO, Tx jitter, Rx jitter, Frame type, CRC setting and Idle code for the E1 link. To return to the previous display, enter ESC.

Enter 3 to *Display Data Port Parameter*

```
<< Display Data Port Parameter >>

Type           : V.35
Clock          : DCE
Clock Polarity : TX Positive ; RX Negative


Press "ESC" to previous menu.
```

The Data Port display shows the current setting of the physical data port. The clock setting and TC RC polarity are also shown in this information display. Press ESC to return.

Enter 4 to *Display the Time Slot Mapping*

```
<< Display Time Slot Mapping >>

SLOT : 00 01 02 03 04 05 06 07
TYPE :  N  B  B  N  N  N  N  N
SLOT : 08 09 10 11 12 13 14 15
TYPE :  N  N  N  N  N  N  N  N
SLOT : 16 17 18 19 20 21 22 23
TYPE :  N  N  N  N  N  N  N  N
SLOT : 24 25 26 27 28 29 30 31
TYPE :  N  N  N  N  N  N  C  C

N: Time Slot not used Y: Data Port
C: E1 Idle Code       B: Bert Time Slot


Press "ESC" to previous menu.
```

The Time Slot mapping display shows the assignments for all of the 32 timeslots of the E1 frame. All timeslots 0-31 are shown with the assigned abbreviations shown directly beneath. In CCS and CAS modes, never assign TS0. In CAS mode, never assign TS16. To return to the previous display, enter ESC.

Enter 5 to *Alarm BufferDisplay Menu*

```
<< Alarm Buffer Display Menu >>

1. Display Alarm Buffer
2. Display Remote Alarm Buffer
3. Clear Alarm Buffer


Enter 1-3 or Press "ESC" to previous menu.
```

The function will allow system to display alarm records up to 40 records. Then you can clear all the record by selecting the "3". Press ESC to return.

Enter 6 to *Display Loop Back Test* information

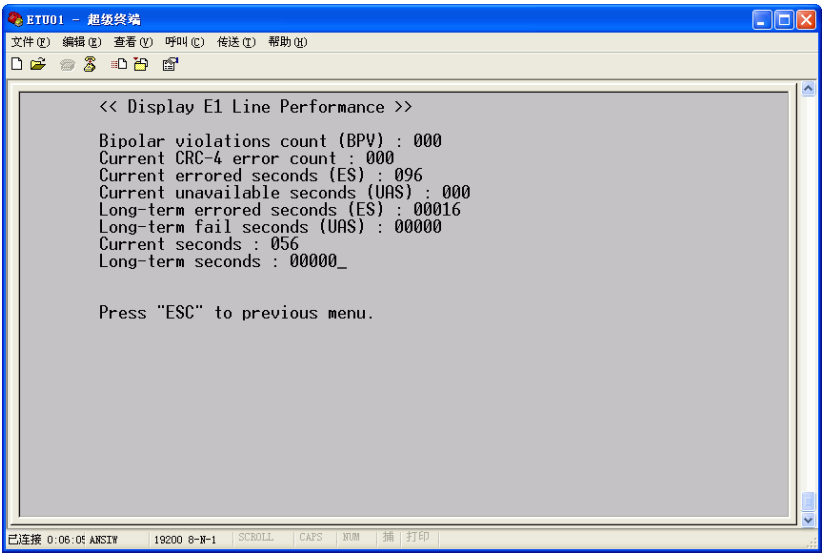
```
<< Display LoopBack Test >>

Function : OFF
E1       : OFF
Data Port: OFF


Press "ESC" to previous menu.
```

Enter ESC to return to the Display System Status menu.

Enter 7 to *Display BERT Test* information.

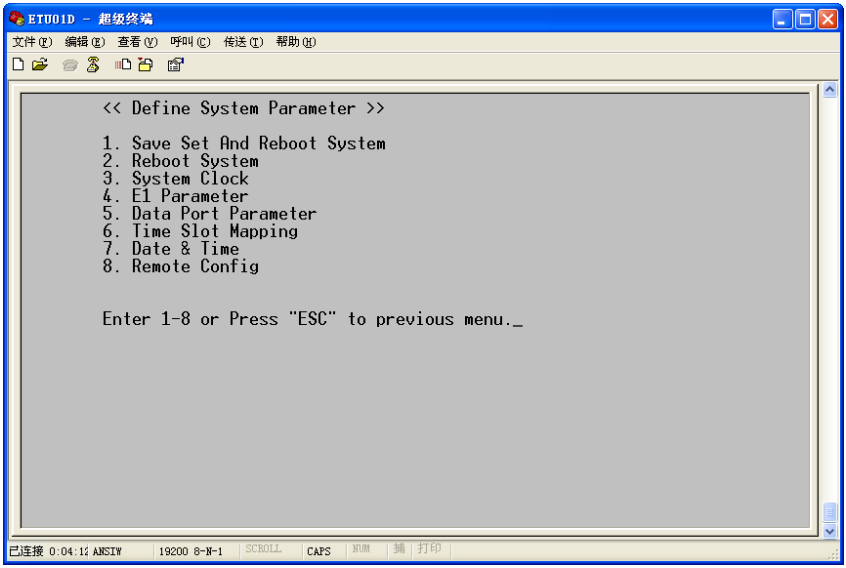
```
        << Display BERT Test >>

        Function : OFF
        Channel  : E1 line
        Pattern  : 2E11-1


        Press "ESC" to previous menu.
```

Enter 8 to *Display E1 Line Performance*.



Enter ESC to return to the Display System Status menu. Then press ESC again to go to the very top menu display.

Now we will look at setting up the system parameters. To do this, enter 2.



The first selection of system parameters is the *Save Set And Reboot System*, and the second selection is Reboot System. We recommend you do a 'Save Set And Reboot System' after finishing the configuration. So let's enter 2 first. ******IMPORTANT****** You must do SAVE SET for configuration changes to be remembered.

```
<< Reboot System >>

Press "ENTER" to confirm, "ESC" to previous menu.
```

You need to wait about 10 seconds, then the screen will go blank. Press ENTER to return to the start up screen. Press 2 to re-enter the Define Configuration page.

To *Define System Clock Parameter*, press 3.

```
<< Define System Clock Parameter >>

System Clock : INTERNAL

1. INTERNAL
2. EXTERNAL
3. RECOVERY


Enter 1-3 or Press "ESC" to previous menu.
```

The display shows that the system clock is currently derived from the internal oscillator. To change it, select one of the appropriate choices, one thru five or to exit without changing press ESC.

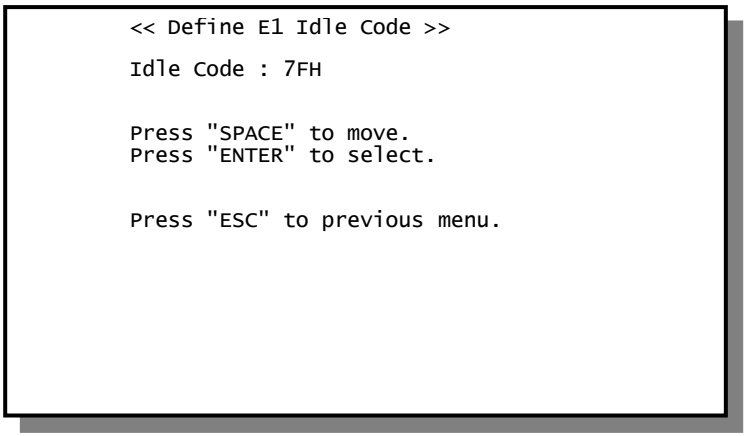
In a typical point-to-point application, the local unit will set the clock source to the built-in oscillator (Internal) and the remote unit will recover clock from the received E1 (Recovery).

If the clock source comes from connected DCE equipment, such as a multiplexer or another modem, a crossover cable may be employed to send the connected DCE's clock from the RC to the ETU01-D's ETC and the clock setting will be set to the data port (External).

Press 4 to *Define E1 Parameter*

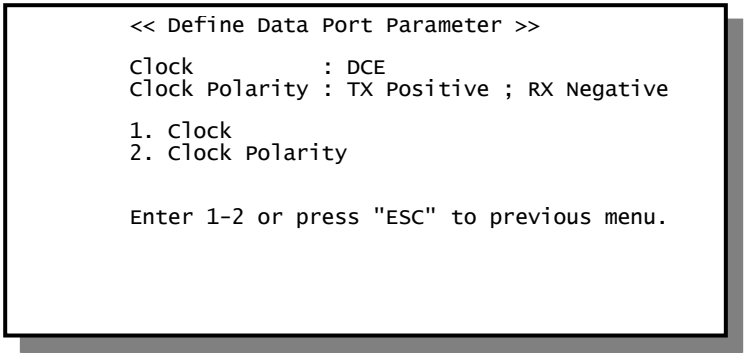
```
<< Define E1 Parameter >>

1. Line Code
2. Impedance
3. LBO
4. TX Jitter
5. RX Jitter
6. Frame
7. CRC-4
8. Idle Code


Enter 1-8 or Press "ESC" to previous menu.
```

Under the display, press 1-8 to define each parameter for the E1. For example, to change the E1 Idle Code, press 8:

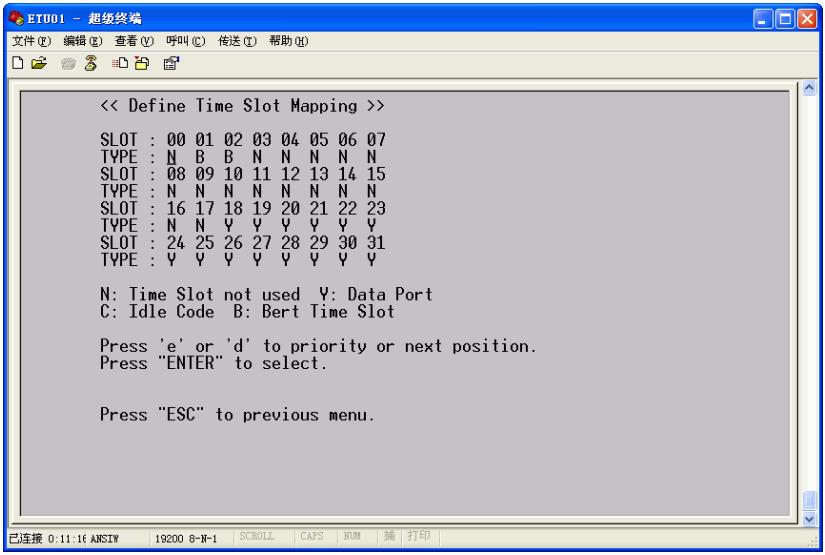


Enter the new idle code with the hex value 00-FF, or to exit, press ESC to the Define E1 Parameter display, then press ESC again to the Define System Parameter display.

Press 5 to *Define Data Port Parameter*



Press 6 to *Define Time Slot Mapping*

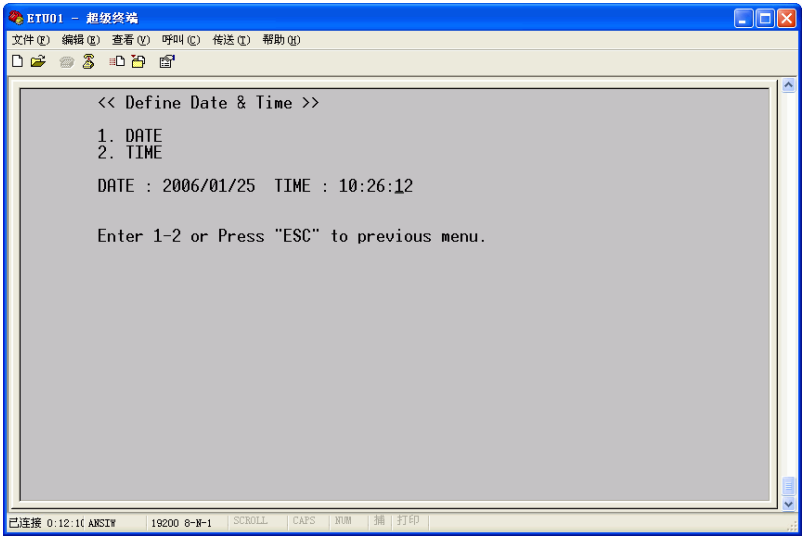

ETOOL - 超级终端
文件(F) 编辑(E) 查看(V) 呼叫(C) 传送(T) 帮助(H)
<< Define Time Slot Mapping >>
SLOT : 00 01 02 03 04 05 06 07
TYPE : N B B N N N N N
SLOT : 08 09 10 11 12 13 14 15
TYPE : N N N N N N N N
SLOT : 16 17 18 19 20 21 22 23
TYPE : N N Y Y Y Y Y Y
SLOT : 24 25 26 27 28 29 30 31
TYPE : Y Y Y Y Y Y Y Y
N: Time Slot not used Y: Data Port
C: Idle Code B: Bert Time Slot
Press 'e' or 'd' to priority or next position.
Press "ENTER" to select.
Press "ESC" to previous menu.
已连接 0:11:16 ANSIW
19200 8-N-1
SCROLL
CAPS
NUM
捕
打印

Pressing the space bar will move the cursor to the next timeslot entry. Repeatedly pressing Enter will make the selection between 'Y, C, B and N'.

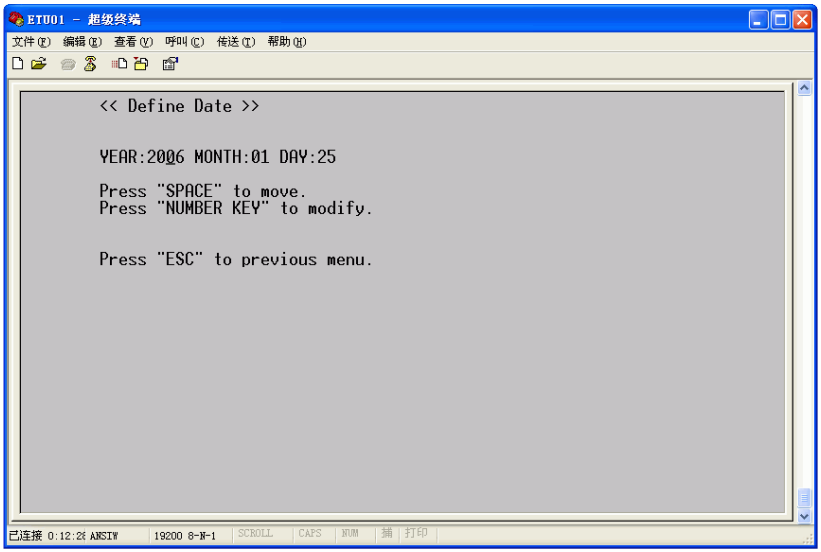
Note: While under FAS, TS0 & TS16 can not be assigned to B (BERT). While under FAS+CAS, TS0 & TS16 can also not be enabled or assigned to B (BERT).

Enter ESC to return to the Define System Parameter menu.

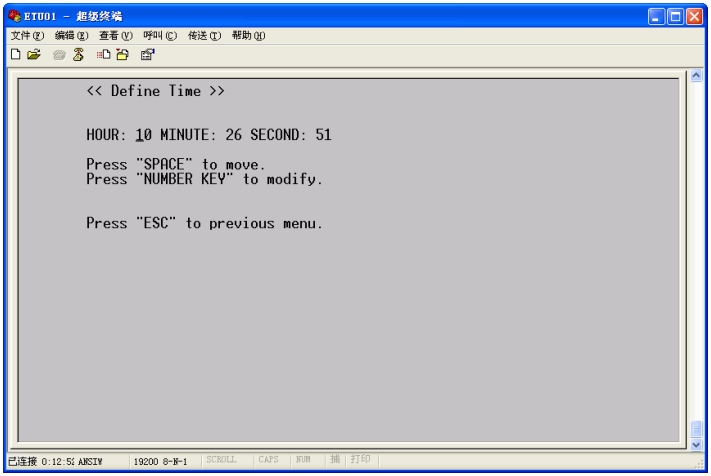
Press 7 to *Define Time & Date*



Pressing "1", the result is displayed as below

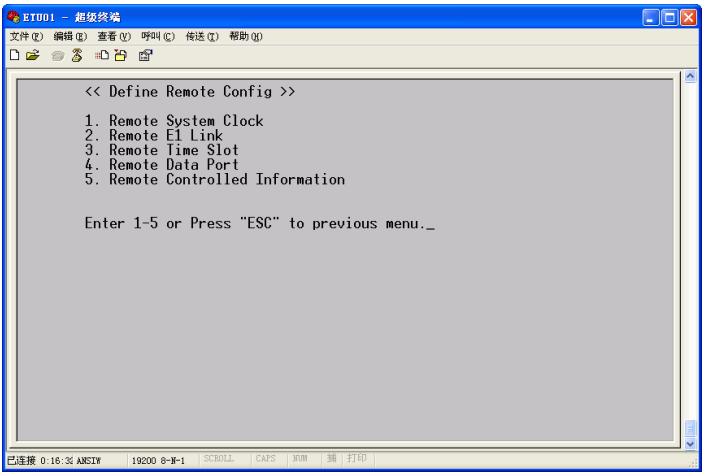


Pressing "2", the result is displayed as below



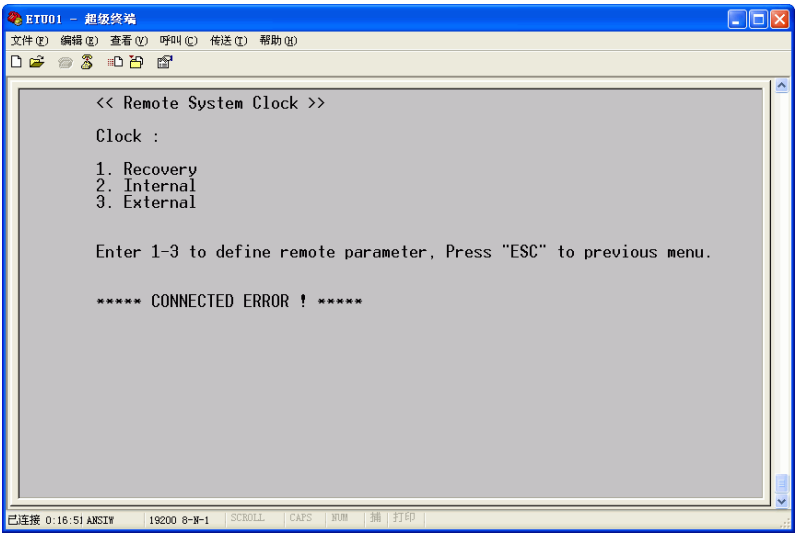
Enter ESC to return to the Define System Parameter menu.

Press 8 to *Define Remote Config*



Notice: This function allows you to configure all the ETU01-D at the far-end side. And the connected ETU01-D must under the normal CCS or CAS E1 mode

When press "1" at the menu here, you can configure the connected ETU01-Dsystem clock at Remote side. The screen will display "CONNECTED ERROR" if the unit is not under the normal E1 mode.

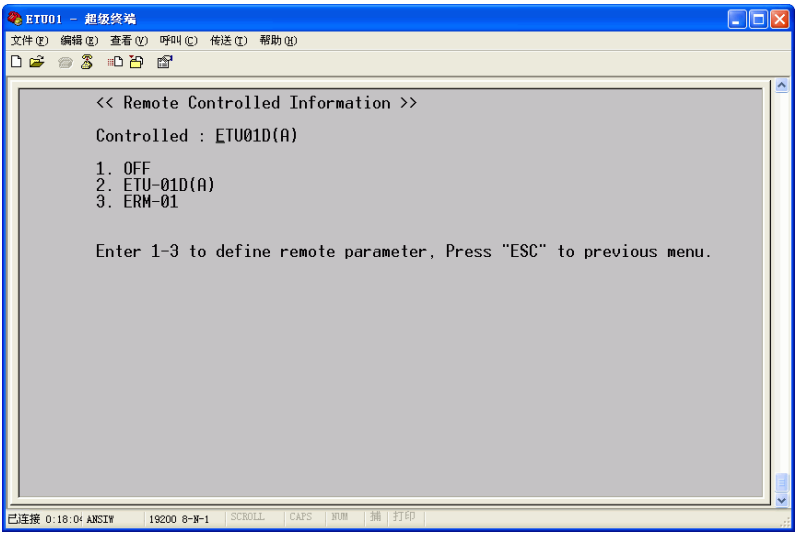


When pressing "5" at the menu here, the system will indicate the remote equipment parameters. Here also can decide the local equipment can be configured from the remote side equipment or not.

"OFF": The local ETU01-D can't be configured from the remote side.

"ETU01-D(A)": Configure the remote side equipment, under this option, the equipment at the remote side is ETU01-D(A).

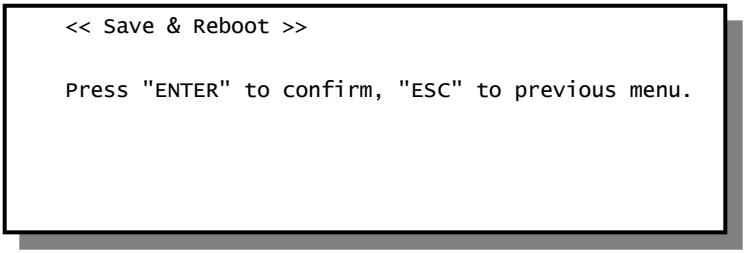
"ERM-01": Configure the remote side equipment, under this option, the equipment at the remote side is E1 I/O card of ERM01.



Enter ESC to return to the Define System Status menu.

Now that all parameters have been set, it would be a good time to save all the settings.

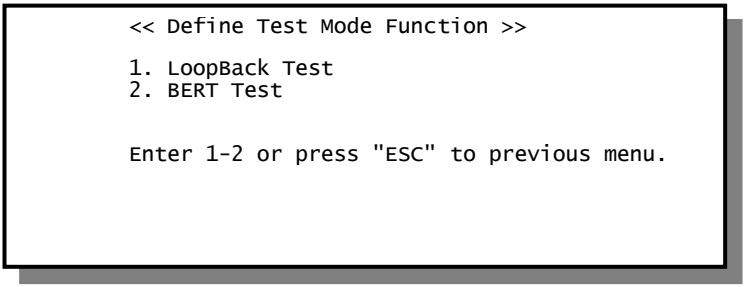
Enter 1 to *Save & Reboot*



Press Enter to confirm. The screen will display the message "Y/N: [N]". Press Enter again, the screen will display the message “Y/N: [Y]” and then reboot system.

Press ESC again to go to the very top menu display.

Now press "3" to set up the *Test Function Parameter*. To do this, enter 3.



To *Define Loop Back Test Function*, Press 1.

```
<< Define LoopBack Test Function >>

Function  : OFF
E1        : OFF      Data Port : OFF

1. Function
2. E1
3. Data Port


Enter 1-3 or Press "ESC" to previous menu.
```

To enable or disable the *Loop back function*, Press 1.

```
<< LoopBack Function >>

Function : OFF

1. ON
2. OFF


Enter 1-2 or press "ESC" to previous menu.
```

The current setting for Loop Back is OFF. To turn on, press 1. To exit without changing, press ESC.

At *"Define Loop back Test Function"* , enter 2.

```
<< E1 LoopBack >>

E1 : OFF

1. OFF
2. Local Analog
3. Local Digital
4. Local Payload
5. Remote Analog
6. Remote Payload


Enter 1-6 or Press "ESC" to previous menu.
```

Press 2-6 to initiate a loop back of the E1 link, press 1 to stop loop back, or press ESC to return to the previous menu without any change.

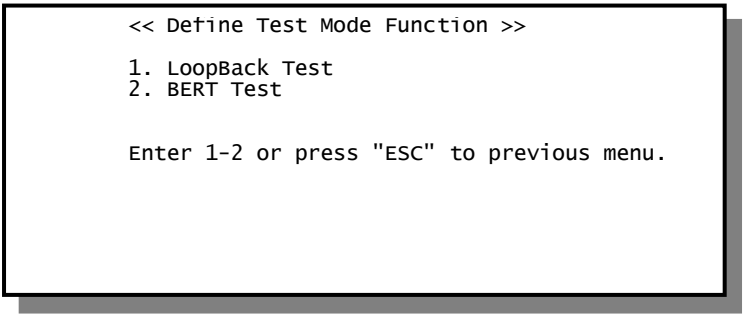
****IMPORTANT**** Remote loop backs are not possible when E1 is in unframed mode.

Press 4 to *Data Port loopback* test function

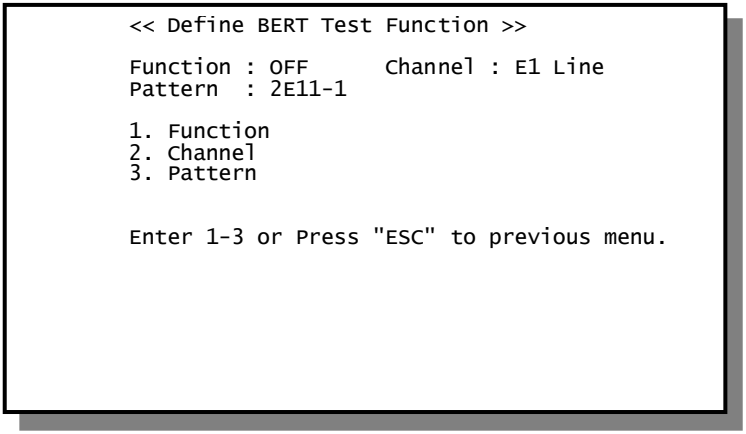
```
<< Data Port1 LoopBack >>

Data Port : OFF

1. OFF
2. Local Analog
3. Local Digital


Enter 1-3 or Press "ESC" to previous menu.
```

Note: When Data Port Local Analog Loop Back is initiated, the DTE connected should be providing its own Clock.

Enter ESC to return to the Define Test Mode Function menu.



Define BERT test function, press 2.



Press 1 to initiate or close the function; press 2 to define the BERT channel (refer to Chapter 1); press 3 to define the BERT pattern; press ESC to exit without changing.

Press ESC one last time to reach to top level menu.

There is no default password for ETU01-D
The following is an example of Password setting for the ***ETU01-D***.
Press 4.

```
        << Password >>

        1. Set Password
        2. Clear Password


        Enter 1-2 or press "ESC" to previous menu.
```

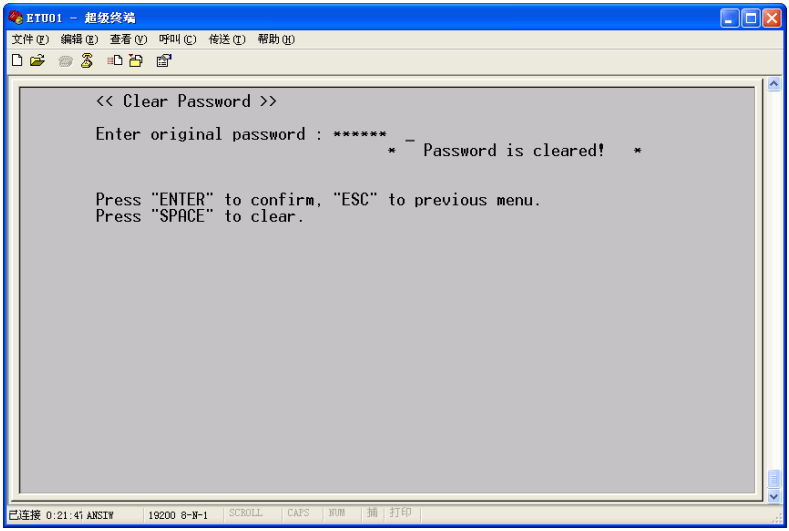
Enter 1 to set the *Password*

```
    << Password >>

    Enter Password (6 Number) :


    Press "ENTER" to confirm, "ESC" to previous menu.
    Press "SPACE" to clear.
```

Here, the system only allows the user to enter the digital for the password, once you enter the non-digital character and press "enter" key, the system will display "Your Password Is Error"

Enter 123456. Then press ENTER, the screen will display: "Your Password is OK !"

You may also clear the previous password by pressing "2" and the main menu for setting password.



Enter the original password,. Then press ENTER, the screen will display:

Your Password is clear!

Press ESC.

Press ESC back to go back to the main menu.

To reset all parameters to the original factory default settings, press 5.

```
<< Reset Data to Factory Default >>

                Reset Data is OK

Press "ENTER" to confirm, "ESC" to previous menu.
```

All settings are effected.

Press ESC.

To exit the terminal mode, press 6. The terminal connection will be dropped and the front panel LCD will return to its normal 'RUN' condition.

******IMPORTANT******
The unit will not transmit normally unless it is in *RUN* mode.

This completes the detailed examples of terminal mode operation for the ***ETU01-D***.

The command list for the Hyper Terminal

Main Menu	Secondary Level Menu	Third-Level Menu	Fourth Level Menu	Options
ENTER/EXIT				
Display System Status	System Clock			
	E1 Line			
	Data Port			
	Time Slot			
	Alarm Buffer	Display Alarm Buffer		
		Display Remote Alarm Buffer		
		Clear Alarm Buffer		
	LoopBack Test			
	BERT Test			
	Performance			
Define System Parameter	Save & Reboot			
	Reboot System			
	System Clock			Internal
				External
				Recovery
	E1 Parameter	Link Code		HDB3
				AMI
		Impedance		75ohm
				120ohm
		LBO		Short
				Long
		TX Jitter		ON
				OFF
		RX Jitter		ON
				OFF
		Frame		Unframe
				CCS
				CAS
		CRC-4		ON
				OFF
		Idle Code		00~FF

	Data Port Parameter	Clock		DCE
				DTE
		Clock Polarity		TX Pos RX Pos
				TX Pos RX Neg
				TX Neg RX Pos
				TX Neg RX Neg
	Time Slot Mapping			
	Date & Time			
	Remote Config	Remote System Clock		Internal
				External
				Recovery
		Remote E1 Link		Remote Frame
				Remote CRC-4
				Remote Cascade
				Remote Idle Code
				Remote RAI
				Remote Line Code
				Remote Impedance
				Remote E-BIT
				Remote LBO
				Remote TX Jitter
				Remote RX Jitter
		Remote Time Slot		

		Remote Data Port	Multiplier	N64
				N56
			CTS	ON
				RTS
			V.54 Loop Status	ON
				OFF
			Port Type	
			Clock	DCE
				DTE
			Clock Polarity	TX Pos , RX Pos
				TX Pos , RX Neg
				TX Neg , RX Pos
				TX Neg , RX Neg
Test Function Parameter	LoopBack Test	Function		ON
				OFF
		E1		Close
				Local Analog
				Local Digital
				Local Payload
				Remote Analog
				Remote Payload
		Data Port		Close
				Local Analog
				Local Digital
	BERT Test	Function		ON
				OFF
		Channel		E1 Line
		Pattern		2E11-1
				2E15-1
				QRSS
Password	Set Password			
	Clear Password			
Reset Data to Default				
EXIT				

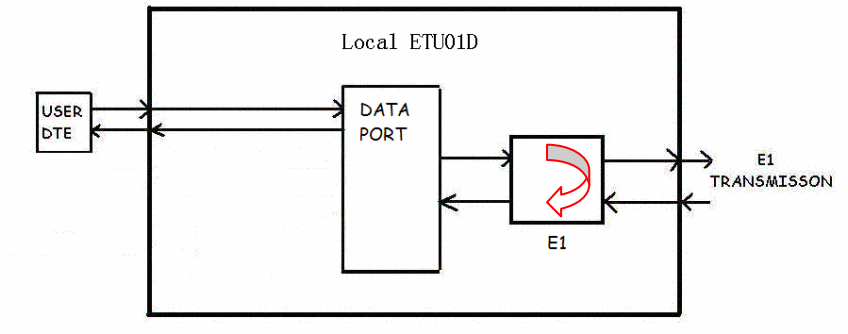
This page left blank intentionally.

Chapter 5 Loopback and BERT Tests

5.1 Test Loops

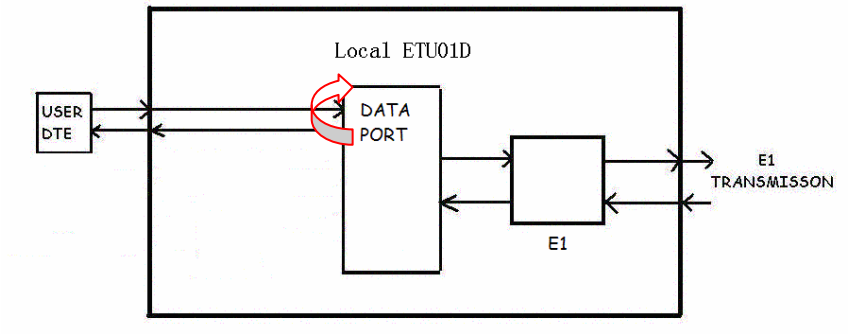
–E1 link loop back

- local analog loop back
-

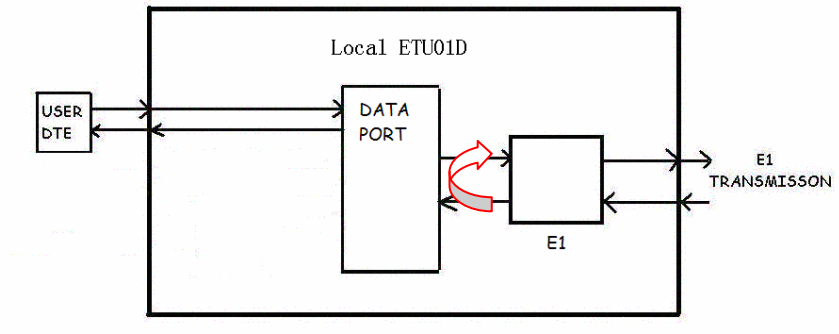


- local digital loop back

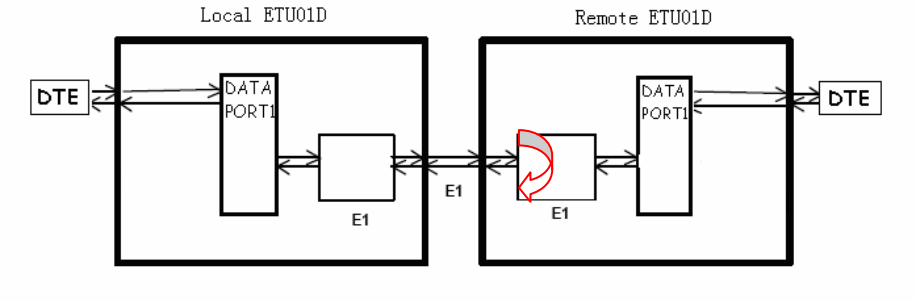
-



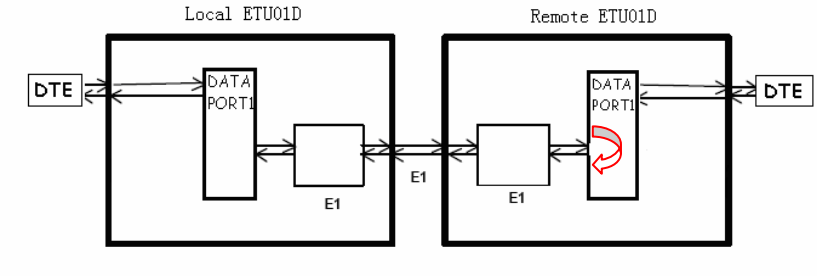
- local payload loop back



- remote analog loop back

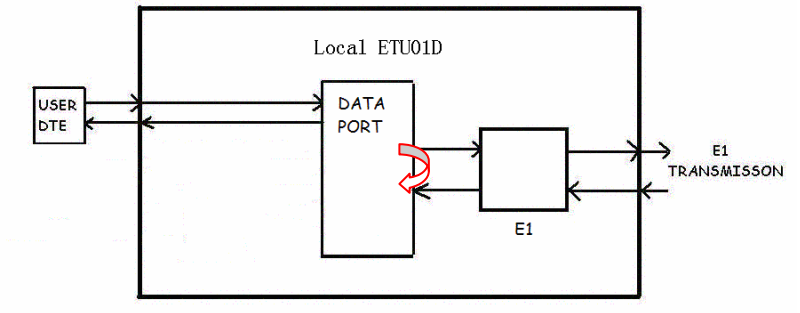


- remote payload loop back

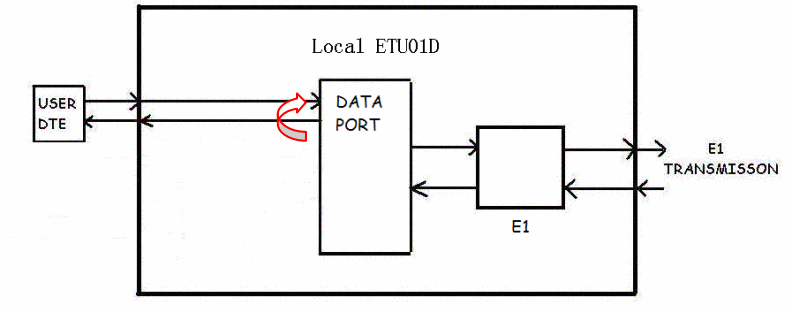


–Data Port loop back

-Data Port1 local analog loop back



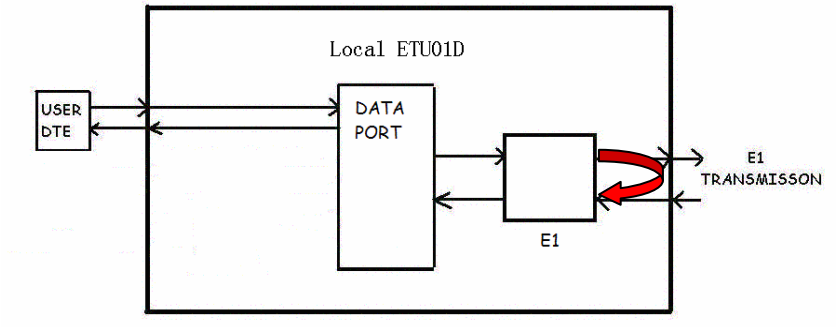
- Data Port1 local digital loop back



Notice: The Remote loop back tests are only available under the E1 framed mode, either in CCS or CAS.

BERT TEST:

-E1



Appendix A

A.1

ETU01-D comes with a V.35 interface, the physical interface is a 34-pin female M-Block type connector wired in accordance with Table as below.

SIGNAL FUNCTION	PIN	CIRCUIT	DIRECTION	DESCRIPTION
Protective Ground	A	Frame	↔	Chassis ground. May be isolated from signal ground.
Signal Ground	B	Signal Ground	↔	Common signal ground.
Transmitted Data	P S	TD(A) TD(B)	To ETU-01D	Serial digital data from DTE.
Received Data	R T	RD(A) RD(B)	From ETU-01D	Serial digital data at the output of the ETU-01D receiver.
Request to Sent	C	RTS	To ETU-01D	An ON signal to the ETU-01D when data transmission is desired.
Clear to Sent	D	CTS	From ETU-01D	Constantly ON.
Data Set Ready	E	DSR	From ETU-01D	Constantly ON, except during test loops.
Data Terminal Ready	H	DTR	To ETU-01D	Not used.
Data Carrier Detect	F	DCD	From ETU-01D	Constantly ON, except when a loss of the received carrier signal is detected.
External Transmit clock	U W	ETC(A) ETC(B)	To ETU-01D	A transmitted data rate clock input from the data source.
Transmit Clock	Y AA	TC(A) TC(B)	From ETU-01D	A transmitted data rate clock for use by an external data source.
Receive Clock	V X	RC(A) RC(B)	From ETU-01D	A received data rate clock for use by an external data source.
External Receive clock	Z BB	ERC(A) ERC(B)	To ETU-01D	A received serial data rate clock input from the DTE.
Remote Loop back	HH	RL	To ETU-01D	When on, commands ETU-01D into remote loop back, can disable by DIP sw.
Local Loop back	JJ	LL	To ETU-01D	When on, commands ETU-01D into local loop back, can disable by DIP sw.
Test Indicator	KK	TM	From ETU-01D	ON during any test mode

Table A-1 V.35 user data channel connector pin allocation

Appendix A

TECHNICAL INQUIRY FORM

CTC Union Technologies Inc

Fax:+886-2-2799-1355
Tel:+886-2-2659-1021
E-mail:support@ctcu.com
Taipei Taiwan

Attn : Technical Support Division
From Company: _____
Name:_____
Tel: (___)_____
Fax:(___)_____

- **MODEL: ETU01-D**
- **ACTIVITY: Check every setting including physical interface and system setting**
- **SYS CONFIGURATION:**

- **Question:**

Parameters	User setting; check all configurations		
Applications	Point-to-point ☐ ETU01-D to E1 Network device ☐		
System Clock	INTERNAL ☐ RECOVERY (E1) ☐ EXTERNAL ☐		
Main E1 link parameters			
Line Code	AMI ☐ / HDB3 ☐		
Line Impedance	Unbalanced 75 ohms ☐ / Balanced 120 ohms ☐		
LBO	Long ☐ / Short ☐		
Tx Jitter	ON ☐ / OFF ☐	Rx Jitter	ON ☐ / OFF ☐
Frame	Unframed ☐ -FAS (PCM31) ☐ -FAS+CAS (PCM30) ☐	-CRC4 ON ☐ / OFF ☐ -IDLE CODE (00-FF)	
Time slot mapping	☐☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐☐☐☐	N: Not assigned Y: Data Channel . C: Insert idle code on E1 Tx side. (Refer to E1 Link Parameter Detail to set the idle code.) B: BERT test.	
Data port parameter			
Data port	V.35		
Clock select	DCE ☐ / DTE ☐		
Clock polarity	TX POS RX NEG ☐ / TX POS RX POS ☐ TX NEG RX POS ☐ / TX NEG RX NEG ☐		

E1 Series

CTC Union Technologies Co., Ltd.
Far Eastern Vienna Technologies Center
(Neihu Technology Park)
8F, No. 60, Zhouzi St., Neihu, Taipei, Taiwan
Phone:+886-2-2659-1021 Fax:+886-2-2799-1355
E-mail: info@ctcu.com http://www.ctcu.com